

IN THE CLAIMS:

1.-26. (Canceled)

27. (Previously Presented) A subsea lubricator for attachment to a subsea Christmas tree comprising at least one tree passage therethrough, said subsea lubricator comprising:

a pressure control assembly;

a tool housing assembly adapted to be positioned above said pressure control assembly, said tool housing assembly comprising at least one lubricator passage that is adapted to receive a tool therein, said tool being operatively coupled to a wire, a cable or a line used in lowering said tool into said tool housing assembly;

a sealing assembly adapted to be positioned above said tool housing assembly, said sealing assembly adapted to slidably seal around said wire, cable or line; and

at least one bypass assembly comprising at least one bypass passage that is in fluid communication with said at least one lubricator passage and at least one tree passage in said subsea Christmas tree.

28. (Previously Presented) The subsea lubricator of claim 27, wherein said at least one bypass assembly further comprises at least one lower bypass pipe and at least one upper bypass pipe removably connected to said at least one lower bypass pipe.

29. (Previously Presented) The subsea lubricator of claim 28, wherein said at least one bypass assembly comprises at least two upper bypass pipes.

30. (Previously Presented) The subsea lubricator of claim 28, wherein said tool housing assembly comprises a tool housing portion comprising an upper end and a bore which defines a portion of said at least one lubricator passage, said bypass assembly further comprising a crossover assembly for fluidly connecting said at least one upper bypass pipe with said at least one lubricator passage at a location proximate to said upper end of said tool housing portion.

31. (Previously Presented) The subsea lubricator of claim 30, wherein said pressure control assembly comprises a lower end, a bore which defines a portion of said at least one lubricator passage, and at least one pressure control valve for selectively closing said at least one lubricator passage, said bypass assembly further comprising a valve assembly for fluidly connecting said at least one lower bypass pipe with said at least one lubricator passage at a location below said at least one pressure control valve.

32. (Previously Presented) The subsea lubricator of claim 30, wherein said crossover assembly further comprises a connector for fluidly connecting said crossover assembly to an external fluid source.

33. (Previously Presented) The subsea lubricator of claim 31, wherein said subsea Christmas tree further comprises a production passage and an annulus passage, said valve assembly further comprising a first inlet fluidly connected to said at least one lower bypass pipe, a second inlet fluidly connected to a subsea umbilical, a first outlet fluidly connected to said production passage in said subsea Christmas tree, and a second outlet fluidly connected to said annulus passage in said subsea Christmas tree.

34. (Previously Presented) The subsea lubricator of claim 33, wherein said valve assembly further comprises at least one check valve disposed in each of said first and second inlets.

35. (Previously Presented) The subsea lubricator of claim 33, wherein said valve assembly further comprises at least one stop valve disposed in said first outlet.

36. (Previously Presented) The subsea lubricator of claim 33, wherein said valve assembly further comprises at least one stop valve disposed in said second outlet.

37. (Previously Presented) The subsea lubricator of claim 31, further comprising an adaptor, said valve assembly forming a portion of said adaptor.

38. (Previously Presented) The subsea lubricator of claim 37, wherein said adaptor is removably attached to said pressure control assembly, said adaptor comprising a subsea connector adapted for connecting to said subsea Christmas tree.

39. (Previously Presented) The subsea lubricator of claim 37, wherein said subsea Christmas tree further comprises a production passage and an annulus passage, said adaptor further comprising a first adaptor passage for fluidly connecting said at least one lubricator passage with said production passage in said subsea Christmas tree, and a second adaptor

passage for fluidly connecting said at least one lower bypass pipe with said annulus passage in said subsea Christmas tree.

40. (Previously Presented) The subsea lubricator of claim 37, wherein said subsea Christmas tree further comprises a production passage and an annulus passage, said adaptor further comprising a first adaptor passage for fluidly connecting said at least one lubricator passage with said annulus passage in said subsea Christmas tree, with a second adaptor passage for fluidly connecting said at least one lower bypass pipe with said production passage in said subsea Christmas tree.

41. (Previously Presented) The subsea lubricator of claim 37, further comprising a valve actuator.

42. (Previously Presented) A method for circulating fluid in a subsea lubricator attached to a subsea Christmas tree landed on a subsea well, said subsea lubricator comprising a tool housing assembly adapted to receive a tool therein, said tool being operatively coupled to a wire, a cable or a line used in lowering said tool into said tool housing, and a sealing assembly adapted to be positioned above said tool housing assembly, said sealing assembly adapted to slidably seal around said wire, cable or line, said method comprising:

providing at least one bypass passage fluidly connecting said subsea lubricator to said subsea Christmas tree;

connecting said subsea lubricator to a source of a first external fluid;

injecting said first external fluid into said subsea lubricator to displace a first internal fluid within said subsea lubricator; and
circulating said first internal fluid through said bypass passage and said subsea Christmas tree to said subsea well or into an external flow line.

43. (Previously Presented) The method of claim 42, wherein said first external fluid comprises water.

44. (Previously Presented) The method of claim 42, wherein said first external fluid comprises a hydrate inhibiting fluid.

45. (Previously Presented) The method of claim 44, wherein said hydrate inhibitor is selected from the group consisting of methanol and glycol.

46. (Previously Presented) The method of claim 42, wherein said first external fluid is a diluent fluid.

47. (Previously Presented) The method of claim 42, wherein said first internal fluid comprises water, said method further comprising injecting a hydrate inhibiting fluid into said subsea well concurrently with circulating said first internal fluid.

48. (Previously Presented) The method of claim 42, wherein said first internal fluid comprises hydrocarbons and said first external fluid comprises a mixture of water and a hydrate inhibiting fluid, said method further comprising:

connecting said subsea lubricator to a source of a second external fluid after circulating said first internal fluid, said second external fluid comprising water;
injecting said second external fluid into said subsea lubricator to displace a second internal fluid, said second internal fluid comprising the mixture of water and hydrate inhibiting fluid, the hydrate inhibiting fluid comprising said first external fluid;
circulating said second internal fluid through said bypass passage and said subsea Christmas tree to said subsea well or into said external flow line; and
injecting a hydrate inhibiting fluid into said subsea well concurrently with circulating said second internal fluid.

49. (Previously Presented) A method for killing a subsea well having a subsea Christmas tree landed thereon, said method comprising:

landing a subsea lubricator on said subsea Christmas tree, said subsea lubricator comprising a tool housing assembly adapted to receive a tool therein, said tool being operatively coupled to a wire, a cable or a line used in lowering said tool into said tool housing, and a sealing assembly adapted to be positioned above said tool housing assembly, said sealing assembly adapted to slidingly seal around said wire, cable or line and at least one valve;

providing at least one bypass passage fluidly connecting said subsea Christmas tree with
a source of kill fluid; and
when said at least one valve is closed, injecting said kill fluid into said well through said
bypass passage and said subsea Christmas tree.

50. (Previously Presented) A method of circulating fluids in a subsea well having a
subsea Christmas tree landed thereon, said method comprising:

providing a production passage and an annulus passage in said subsea Christmas tree;
providing a tubing string below said subsea Christmas tree in fluid communication with
said production passage;
providing a tubing annulus below said subsea Christmas tree in fluid in communication
with said annulus passage;
providing a downhole fluid connection between said tubing string and said tubing
annulus;
providing a pressure control assembly having a first passage therethrough and a lower
bypass pipe;
landing said pressure control assembly on said subsea Christmas tree such that said first
passage is fluidly connected to said production passage and said lower bypass
pipe is fluidly connected to said annulus passage;
landing a tool housing assembly on said pressure control assembly, said tool housing
assembly adapted to receive a tool therein, said tool being operatively coupled to
a wire, a cable or a line used in lowering said tool into said tool housing, and a

sealing assembly adapted to be positioned above said tool housing assembly, said
sealing assembly adapted to slidingly seal around said wire, cable or line;
removing said tool housing assembly from said pressure control assembly;
connecting a first supply pipe to said first passage;
connecting a second supply pipe to said lower bypass passage; and
circulating fluid from said second supply pipe, through said lower bypass pipe, through
said annulus passage, down into the well through said tubing annulus, through
said downhole fluid connection, up through said tubing string, through said
production passage, through said first passage in said pressure control assembly,
and into said first supply pipe.

51. (Previously Presented) A method for circulating fluids in a subsea well having a
subsea Christmas tree landed thereon, said method comprising the steps of:

providing a production passage and an annulus passage in said subsea Christmas tree;
providing a tubing string below said subsea Christmas tree in fluid communication with
said production passage;
providing a tubing annulus below said subsea Christmas tree in fluid communication with
said annulus passage;
providing a downhole fluid connection between said tubing string and said tubing
annulus;
providing a pressure control assembly having a first passage therethrough and a lower
bypass pipe;

landing said pressure control assembly on said subsea Christmas tree such that said first passage is fluidly connected to said production passage and said lower bypass pipe is fluidly connected to said annulus passage;
connecting a first supply pipe to said first passage;
connecting a second supply pipe to said lower bypass pipe; and
circulating fluid from said first supply pipe, through said first passage in said pressure control assembly, through said production passage, down into the well through said tubing string, through said downhole fluid connection, up through said tubing annulus, through said annulus passage, through said lower bypass pipe, and into said second supply pipe.

52. (Previously Presented) A subsea lubricator for attachment to a subsea Christmas tree comprising at least one tree passage therethrough, said subsea lubricator comprising:

at least one lubricator passage which communicates with at least one tree passage in said subsea Christmas tree;

at least one bypass assembly comprising at least one bypass passage which communicates with at least one passage in said subsea Christmas tree, the at least one bypass comprising at least one lower and at least one upper bypass pipe removably connected to each other;

a tool housing assembly comprising an upper end and a bore which defines a portion of said at least one lubricator passage, said tool housing assembly being adapted to receive a tool therein, said tool being operatively coupled to a wire, a cable or a line;

a sealing assembly adapted to be positioned above said tool housing assembly, said sealing assembly adapted to slidingly seal around said wire, cable or line; and
a fluid connection between the at least one upper bypass pipe and the lubricator passage at an upper end of the tool housing assembly, the fluid connection comprising a crossover having a connector for attachment of an external fluid supply source.

53. (Previously Presented) A subsea lubricator for attachment to a subsea Christmas tree comprising at least one tree passage therethrough, said subsea lubricator comprising:

at least one lubricator passage which communicates with at least one tree passage in said subsea Christmas tree;

at least one bypass assembly comprising at least one bypass passage which communicates with at least one tree passage in said subsea Christmas tree, the at least one bypass comprising at least one lower and at least one upper bypass pipe removably connected to each other;

a tool housing portion comprising an upper end and a bore which defines a portion of said at least one lubricator passage, said tool housing portion being adapted to receive a tool therein, said tool being operatively coupled to a wire, a cable or a line;

a sealing assembly adapted to be positioned above said tool housing portion, said sealing assembly adapted to slidingly seal around said wire, cable or line;

a fluid connection between the at least one upper bypass pipe and the lubricator passage at an upper end of the tool housing;

a pressure control assembly coupled between the tool housing portion and said subsea

Christmas tree; and

a valve assembly providing fluid connection between the at least one lower bypass pipe

and a passage of the pressure control assembly at a position below at least one

valve of the pressure control assembly, the valve assembly comprising a first inlet

connected to at least one lower bypass pipe, a second inlet connected to an

umbilical, a first outlet connected to a production passage of the Christmas tree,

and a second outlet connected to an annulus passage of the Christmas tree.

54. (Previously Presented) A subsea lubricator for attachment to a subsea Christmas tree comprising at least one tree passage therethrough, said subsea lubricator comprising:

at least one lubricator passage which communicates with at least one tree passage in said subsea Christmas tree;

at least one bypass assembly comprising at least one bypass passage which communicates with at least one tree passage in said subsea Christmas tree, the at least one bypass comprising at least one lower and at least one upper bypass pipe removably connected to each other;

a tool housing portion comprising an upper end and a bore which defines a portion of said at least one lubricator passage, said tool housing portion being adapted to receive a tool therein, said tool being operatively coupled to a wire, a cable or a line;

a sealing assembly adapted to be positioned above said tool housing portion, said sealing assembly adapted to slidably seal around said wire, cable or line;

a fluid connection between the at least one upper bypass pipe and the lubricator passage at an upper end of the tool housing;

a pressure control assembly coupled between the tool housing portion and said subsea Christmas tree;

a valve assembly providing fluid connection between the at least one lower bypass pipe and a passage of the pressure control assembly at a position below at least one valve of the pressure control assembly, the valve assembly comprising a first inlet connected to at least one lower bypass pipe, a second inlet connected to an umbilical, a first outlet connected to a production passage of the Christmas tree, and a second outlet connected to an annulus passage of the Christmas tree; and

an adaptor removably attachable to the pressure control assembly comprising a connector device which is adapted to connector profiles for various Christmas trees.

55. (Currently Amended) A riserless subsea lubricator that is adapted to be attached above a subsea Christmas tree positioned above a subsea well, the riserless subsea lubricator comprising:

a tool housing ~~that is~~ of said riserless subsea lubricator, said tool housing adapted to be positioned above said Christmas tree, said tool housing being adapted to receive a tool positioned therein;

a sealing assembly that is adapted to be positioned above said tool housing, said sealing assembly adapted to slidingly seal around a wire, cable or line that is used in lowering said tool into said tool housing; and

at least one bypass line for circulating fluid from said tool housing to said subsea well or to an external flow line.

56. (Previously Presented) The subsea lubricator of claim 55, wherein said tool housing comprises a single passageway that is adapted to receive said tool.

57. (Previously Presented) The subsea lubricator of claim 55, wherein said tool housing comprises a tubular column that is adapted to receive said tool.

58. (Previously Presented) The subsea lubricator of claim 55, further comprising a pressure control assembly that is adapted to be positioned between said tool housing and said Christmas tree.

59. (Previously Presented) The subsea lubricator of claim 55, wherein said sealing assembly comprises a grease injector head.

60. (Previously Presented) The subsea lubricator of claim 55, wherein said sealing assembly comprises a stuffing box.

61. (Previously Presented) The subsea lubricator of claim 55, wherein said at least one bypass line provides fluid communication between said tool housing and said Christmas tree for circulating fluid from said tool housing to said subsea well.

62. (Previously Presented) The subsea lubricator of claim 55, wherein said at least one bypass line is positioned external of said Christmas tree and said tool housing.

63. (Canceled)

64. (Previously Presented) The subsea lubricator of claim 27, wherein said subsea lubricator is a riserless subsea lubricator.

65. (Previously Presented) The subsea lubricator of claim 52, wherein said subsea lubricator is a riserless subsea lubricator.

66. (Previously Presented) The subsea lubricator of claim 53, wherein said subsea lubricator is a riserless subsea lubricator.

67. (Previously Presented) The subsea lubricator of claim 54, wherein said subsea lubricator is a riserless subsea lubricator.